

Edible insects as a source of iron

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON21631

Source

NTR

Brief title

INSECTAIR

Health condition

Iron deficiency
Anemia
Bioavailability
Edible insects
Fractional iron absorption

Sponsors and support

Primary sponsor: Wageningen University & Research

Source(s) of monetary or material Support: Wellcome Trust - UK

Intervention

Outcome measures

Primary outcome

Fractional iron absorption

Secondary outcome

Study description

Background summary

Rationale: Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources. The fact that insects are a common food source for 2 billion people already provides excellent proof of its acceptability, especially in lower and middle income countries. In this project, we will carry out experiments to investigate the potential of insects as a source of iron when consumed as a common East African meal.

Objective: The primary objective is to assess the relative bioavailability of iron from insect (house cricket – *Acheta domesticus*) added to either a high- or low-phytate meal in humans and its potential to provide bioavailable iron. The secondary objectives are: To determine whether addition of edible house crickets enhances or inhibits the absorption of native or fortification iron from non-inhibitory or inhibitory meals

Study design: Single blind randomized partial Williams cross-over design

Study population: Twenty four (24) female volunteers, 18 - 30 years old with marginal iron status (ferritin <25 ng/ml) from the human volunteer database kept at the Division of Human Nutrition.

Intervention: Freeze dried and grinded house crickets labelled with ^{57}Fe will be added to refined (non-inhibitory) maize porridge or to non-refined (inhibitory) maize porridge. Compared to two additional study test-meals which will contain ^{54}Fe added to either non-refined/ refined maize porridge (inhibitory/ non-inhibitory food matrix respectively), the test meals will enable us to assess the relative bioavailability of iron from an house cricket-enriched low-phytate meal (non-inhibitory) or high-phytate (inhibitory) food matrix. The last two test meals will contain half the amount of freeze dried and grinded non-labelled house crickets labelled with $^{58}\text{FeSO}_4$ added to either refined (non-inhibitory) or non-refined (inhibitory) maize porridge. These meals will enable us to answer the question whether edible house crickets enhance/inhibit absorption of native or fortificant iron in inhibitory and/or non-

inhibitory meals.

Main study parameters/endpoints: The main study endpoint is the relative bioavailability (RBV) of iron from house crickets in a low phytate meal (non-inhibitory food matrix) compared to a high-phytate meal (inhibitory food matrix). As a secondary endpoint, we will investigate the RBV of native or fortification iron in non-inhibitory or inhibitory meals after addition of edible house crickets.

Study objective

Edible insects contain iron at similar concentrations as meat and is mostly organically bound. It is currently not known to what extent iron from edible insects is absorbed in humans.

Study design

Fractional iron absorption will be determined at two time points for 3 experimental meals each.

Intervention

6 experimental meals consisting of maize meal porridge prepared from either refined or whole grain maize flour, enriched with intrinsically ^{57}Fe -labelled crickets (freeze dried, grinded), with unlabelled crickets and ^{54}Fe -labelled iron sulphate fortificant, or with ^{58}Fe labelled iron sulphate fortificant.

Contacts

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Eligibility criteria

Inclusion criteria

- Female
- Age range: 18-30 years
- Body weight <65 kg
- Marginal iron status (serum ferritin <25 ng/ml/56.2 pmol/l)

Exclusion criteria

- Pregnancy or breastfeeding
- Hematologic diseases, e.g. hemochromatosis
- Severe anaemia (<80 g/L/ 4.96 mmol/L)
- Elevated CRP (>8.0 mg/L)
- Any self-reported metabolic, gastrointestinal, kidney or chronic diseases such as diabetes, renal failure, hepatic dysfunction, hepatitis, hypertension, cancer, or cardiovascular diseases.
- Continuous or long-term use of medication (except for contraceptives)
- Use of multivitamin/mineral supplements from 2 weeks prior to study until the end
- Blood transfusion, blood donation or severe blood loss (injury, surgery) over the past 6 months
- Having a history of medical or surgical events that may significantly affect the study outcome
- Inability to follow the study procedures, e.g. due to language, psychologic disorders or dementia

- Allergies to crustaceans or mites
- Medically prescribed diet
- Fear of blood draws
- Participation in other biomedical studies

Study design

Design

Study type:	Interventional
Intervention model:	Crossover
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)
Control:	N/A , unknown

Recruitment

NL	
Recruitment status:	Recruiting
Start date (anticipated):	22-01-2018
Enrollment:	24
Type:	Anticipated

Ethics review

Positive opinion	
Date:	25-01-2018
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 46965

Bron: ToetsingOnline

Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL6821
NTR-old	NTR7007
CCMO	NL59400.081.16
OMON	NL-OMON46965

Study results